CHAPTER 1 Calculator Notes for the fx-7400G Plus

Note 1A • Setting the Mode

Each mode on your calculator has different settings that you can change. From the Main Menu, select RUN. Press [SHIFT] [SET UP] to display the screens at right. The settings shown here are the ones that you will use most often in this course while in RUN mode. Arrow down to see more settings. Other modes may have different choices on their setup screens. If your calculator does not display these settings in RUN, follow the steps below to change them.

a. Use the arrow key to highlight the setting you want to change.

b. Press the function key corresponding to the value you want to use.

c. When you have selected the settings you want, press [QUIT] to exit from the setup screen.

In this class, you will need to change some of these settings during the year. The following list is a description of the mode settings that you may need (or want) to change. There are some other settings in some modes that should not concern you in this course. The list may not mean much to you now, but your textbook will refer you back to this note several times during the course. All of these settings do not appear in all modes.

a. **S-Wind** (statistics window) should be set to **Man** in this course.

b. **G-Function** (graph function) gives you the choice to display or not display the function on the screen with its graph.

c. **F-Type** (function type) refers to the type of function (or relation) currently active on the calculator. **Y=** is the usual setting. The **Parm** (parametric) setting and inequality settings are also used. Press [F8] [▶] to see the inequality options.

d. **D-Type** (draw type) refers to the way graphs are drawn. **Con** (connected) means that each calculated point will be connected to the next. **Plot** means that each calculated point is drawn by itself.

e. **Angle** allows you to choose the type of angle measure. In this course, you will use only the **Deg** (degree measure). This setting is not important until you reach the chapter on geometry.

f. **Display** refers to the way in which numbers are written. The options are **Fix** (fixed), **Sci** (scientific), **Norm** (normal), and **Eng** (English). Usually the setting should be **Norm. Sci** is used in the chapter on exponents. After you choose **Sci**, you also decide on the total number of digits you want displayed. The **Fix** setting is useful in hiding long decimal answers and will make some numbers clearer. After choosing **Fix**, you choose how many digits appear to the right of the decimal point. This setting is helpful in applications involving money, for example, where one wants two decimal points showing. Change this setting back to **Norm** when you don't need a special display.

g. **Simplify** allows you to decide whether a fraction is automatically reduced to its lowest terms (**Auto**) or whether you have to reduce it yourself (**Man**). Usually this setting should be on **Auto**, unless you want to practice reducing fractions.

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h. Frac (fraction) gives two options as to how fractions greater than 1 are displayed. a_b/c means numbers will be displayed as mixed numbers. d/c means they will be displayed as improper fractions. In this course you can use either setting.

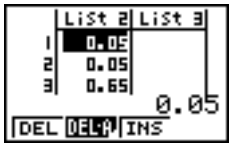
If you find that your screen looks strange when you try to do something, it's a good idea to look at the setup screen to see if any settings have been changed.

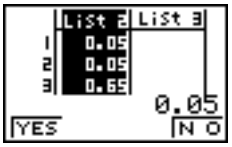
Note 1B • Entering Lists

There are six lists in the calculator: List 1 through List 6. You can enter up to 255 elements into a list if enough memory is available. You can directly enter data into lists either in LIST mode or in STAT mode.

Clearing Data

Select LIST or STAT from the Main Menu by arrowing to the icon and pressing EXE. If a list already has data in it, you can delete the data by using the DEL function. With any entry in the list highlighted, press ▶ to show more menu options. Press F2 (DEL-A) followed by F1 (YES).





Entering Data Directly into a List

Follow the steps below to enter data, for example, {400, 455, 390, 450, 360, 320, 480, 480}, into a list.

a. From the Main Menu, select either STAT or LIST.

b. Enter each number into List 1. After entering each data value, press EXE. When you are finished entering the data, press QUIT. If you want to add a data value in the middle of the list, move the cursor to the place of insertion, press ▶ F3 (INS), and then enter the number. To remove an entry from a list, highlight the entry and press F1 (DEL). If F1 (DEL) is not an option, press ▶ to see more options.

Entering Data into a List from the Run Screen

If you are working with a short list, you may want to enter it while in the Run screen. To enter the data {1, 2, 3, 4} into List 1 in RUN mode, follow the steps below.

a. Choose RUN from the Main Menu. Press SHIFT [{].

b. Press 1 , 2 , 3 , 4.

c. Press SHIFT [}].

d. Press → OPTN F1 (LIST) F1 (List) 1 EXE.

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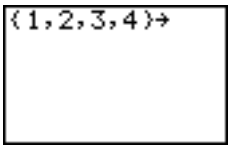
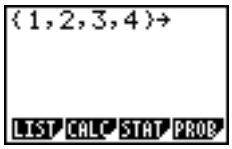
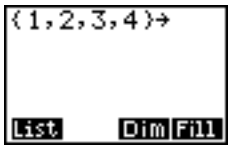
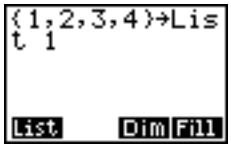
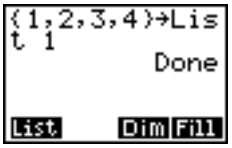
e. You can check to see that the new data is in the list by pressing MENU and going to either STAT or LIST.



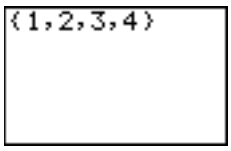


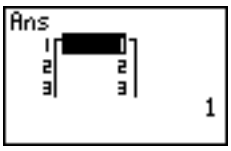


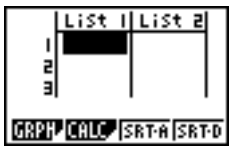




You can also enter a list in RUN mode without storing it in a stat list by entering the values as in the preceding **step b.**

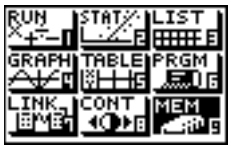






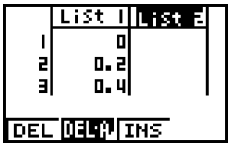
Deleting Lists

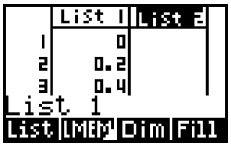
To delete a single list, highlight any entry in the list. If the DEL-A function does not appear as an option, press ▶ to show more menu options. Press F2 (DEL-A) followed by F1 (YES). To delete all lists, go into MEM mode from the Main Menu. Press EXE to go to the Memory Usage screen. Use the cursor to highlight List. Press F1 (DEL) F1 (YES).

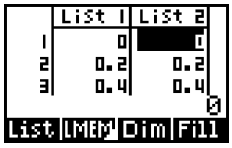


Moving a List

To move a list, begin by highlighting the heading of an empty list. OPTN F1 (LIST) F1 (List), enter the number of the list whose contents you want to copy, and press EXE. The list data appears. You can now delete or overwrite the data in the original list, and the data will remain in the new list.

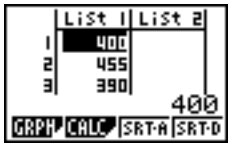






Note 1C • Mean, Median, and Mode

If you are not already in STAT mode, press MENU and select STAT from the Main Menu. Enter the data into a list. (See **Note 1B** if you don't remember how to enter data into a list. This example uses the same data as the first list entered in **Note 1B.**)



a. Press MENU and select RUN.

b. Press OPTN F1 (LIST) ▶.

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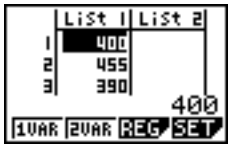
c. Press F4 (MEAN) or ▶ F1 (MED).

d. Press OPTN F1 (LIST) F1 (List) 1, if the data is in List 1, and close the parentheses.

e. Press EXE.

You can also calculate all the statistical values of a data set at once, including the mean, median, and mode; and summary values.



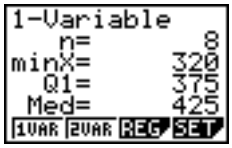
a. Press MENU 2 to enter STAT.

b. Press F2 (CALC).

c. Press F4 (SET) and make sure that 1Var X is set to List 1, or whichever list your data is in, and that 1Var F is set to 1. Press QUIT.

d. Press F2 (CALC) F1 (1VAR).

Toggle the arrow key down to display the entire list of values.



$\bar{x}$=416.875	the mean
Σx=3335	the sum of the *x*-values
Σx^2=1414^{+06}	the sum of the squares of the *x*-values
$x\sigma n$=54.9395	the population standard deviation
$x\sigma n-1$=58.7329	the sample standard deviation
n=8	the number of data values
minX=320	the minimum of the list
Q1=375	the first quartile
Med=425	the median
Q3=467.5	the third quartile
maxX=480	the maximum of the list
Mod=480	the mode of the list

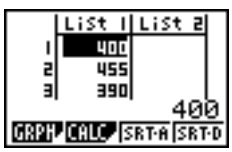
Errors

If your values do not match your data, you may have the wrong list selected. Press F2 (CALC) F4 (SET) to choose the list for 1-variable statistics. If you get a Dim ERROR message, you have selected a blank list.

Note 1D • Box Plots

Entering the Data

Enter the data into a list. In this example, List 1 is {400, 455, 390, 450, 360, 320, 480, 480}. (See **Note 1B** if you need help entering data.)



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Setting the VIEW WINDOW Values

Press SHIFT [SET UP], highlight S-Wind, and press F2 (Man) QUIT.

Press SHIFT [V-Window] and input the following values on the View Window screen. Press EXE after each entry.

Xmin: 300 (This value is a number slightly less than the minimum of the data.)

max: 500 (This value is a number slightly greater than the maximum of the data.)

scl: 1 (This number does not affect a box plot.)

Toggle the arrow key down to get to the *y*-values.

Ymin: 0

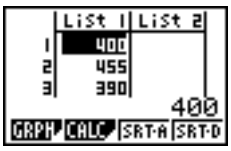
max: 10 (This number is not important for a box plot.)

scl: 0 (This number does not affect a box plot.)

Press QUIT or EXE when you are done entering values. The view window shown is [300, 500, 1, 0, 10, 0].

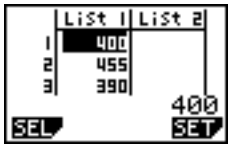
Displaying the Box Plot

This example uses the data in List 1, but you can choose any list.



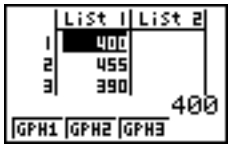
a. Press F1 (GRPH) ▶ F4 (SET) to set up the graph.

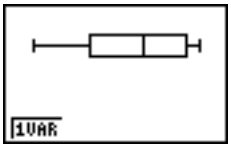
b. Press F1 (GPH1).



c. Highlight G-Type. Press ▶ F2 (Box). Choose List 1 for XList and 1 for Freq. Press QUIT.

d. Press F1 (GRPH) and choose F1 (GPH1).

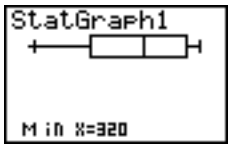




e. Press QUIT to leave the graph screen.

Tracing on a Box Plot

With the graph on the screen, press SHIFT [Trace]. The trace option allows you to see the five summary values for the box plot by toggling the arrow key left and right. When you toggle the arrow key up and down, you move from one box plot to another. (See the **Graphing More Than One Box Plot** section that follows.) Look in the upper-left corner of the calculator screen to see which graph the calculator is tracing. The calculator will trace a statistical graph even if the graph is not visible in the current window. Be sure to turn off any graphs you do not want to see or trace.



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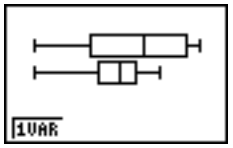
Graphing More Than One Box Plot

The calculator can graph up to three box plots at once. Follow the directions for making a box plot and set up GPH2, GPH3, or both. Be sure the list you select when setting up each box plot is the same list in which you've entered the data. Press QUIT F1 (GRPH) ▶ F1 (SEL). Turn on the graphs you wish to view and press F4 (DRAW).



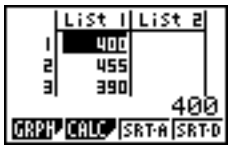
Errors

If you don't see a graph, check Xmin and Xmax in the view window to make sure that your data lies between those values. If you get a Dim ERROR message when you try to graph, you have selected a blank list. If anything appears on the graph other than the statistical graph you set, press SHIFT [Sketch] F1 (Cls) to clear the other graph from the screen. Press QUIT when you are ready to leave the graph screen.

Note 1E • Histograms

Entering the Data

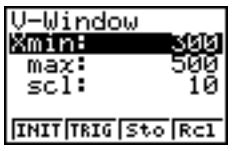
Enter the data into a list. In this example, List 1 is {400, 455, 390, 450, 360, 320, 480, 480}. (See **Note 1B** if you need help entering the data.)



Setting the VIEW WINDOW Values

Select STAT from the Main Menu. Press SHIFT [SET UP]. With S-Wind highlighted, press F2 (Man) QUIT.

Press SHIFT [V-Window] and enter the following values into the View Window screen. Press EXE after each entry.



Xmin: 300 (This value is a number slightly less than the minimum of the data.)

max: 500 (This value is a number slightly greater than the maximum of the data.)

scl: 10 (This number sets the distance between tick marks on the horizontal axis. This number is not critical, but if it's too small, the tick marks will make the horizontal axis appear too thick.)

Toggle the arrow key down to get to the *y*-values.

Ymin: −0.5 (Using a negative value allows you to see the horizontal axis. This value should be about a quarter or a fifth the Ymax value, but the opposite sign).

max: 2 (This value should be the height of the tallest bar. You might have to revise this value when you look at the graph. Tracing on the graph can help you determine the maximum bar height.)

scl: 0 (This value does not affect a histogram.)

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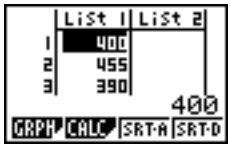
Press QUIT or EXE when you are done entering values. The view window shown is [300, 500, 10, −0.5, 2.0].

Before you graph, you will be asked to enter a start value (Strt) and a pitch (ptch). The start value is the *x*-value of the histogram starting point. The pitch determines the width of the histogram bars (also called *bins*). You may need to extend your range one bar width beyond where you think it should be by increasing the Xmax value. You may want to create a histogram with as few as five or as many as ten bars. Experiment with different values for ptch to see what effect each has on the graph.

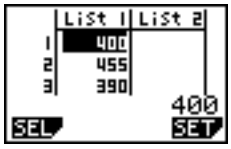
Displaying the Histogram

This example assumes the data is in List 1, but you can choose any list.



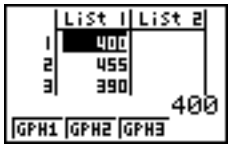
a. Press F1 (GRPH) ▶ F4 (SET) to set up the graph.

b. Press F1 (GPH1).

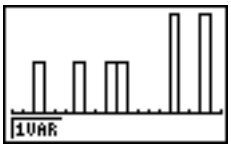


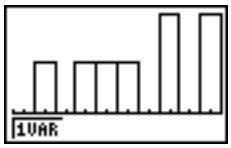
c. Highlight G-Type. Press ▶ F1 (HIST). Choose List 1 for XList and 1 for Freq. Press QUIT.

d. Press F1 (GRPH) and choose F1 (GPH1). (To manually select one or more graphs, do not select GPH1, GPH2, or GPH3, but instead press ▶ F1 (SEL). Set S-Graph1 to On and S-Graph2 and S-Graph-3 to Off. Press F4 (DRAW).)



e. The Set Interval menu will appear. You may enter new values. The start (Strt) value is the horizontal value at which the first bar begins. The pitch (ptch) value is the width of the bars. A smaller pitch value results in narrow bars. Press EXE after entering each value. Press F4 (DRAW) to see the graph.

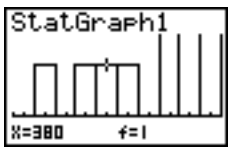




f. Press QUIT when you are ready to leave the graph screen.

Tracing on a Histogram

With the graph on the screen, press SHIFT [Trace]. You can trace on each bar to see the median value and the frequency for that value.



Errors

You will get a Ma ERROR message if you attempt to make a histogram with too many intervals (bars). Increase the pitch to correct this error. You may also get an error message if you leave on a graph you're not interested in seeing or if you change the data or the window settings. If anything appears on the graph other than the statistical graph you set, press SHIFT [Sketch] F1 (Cls) to clear the other graph from the screen.

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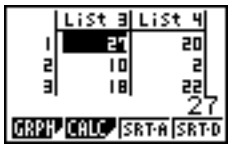
Note 1F • Scatter Plots

Entering the Data

Enter the *x*-coordinates (horizontal axis) into one list and the *y*-coordinates (vertical axis) into another list. In this example, **List 1** contains {27, 10, 18, 5, 47, 36, 8}, and **List 2** contains {20, 2, 22, 3, 45, 28, 15}. (See **Note 1B** if you need help entering the data.)



Setting the VIEW WINDOW Values

If the view window is not already set to manual from a previous graph, set it to manual by pressing SHIFT [SET UP]. With **S-Wind** highlighted, press F2 (**Man**) QUIT. Press SHIFT [**V-Window**] and enter the following values into the View Window screen. Press EXE after each entry.

Xmin: 0 (This value is a number less than the minimum value of the *x*-coordinates.)

max: 50 (This value is a number greater than the maximum value of the *x*-coordinates.)

scl: 5 (This number is the distance between tick marks. You can use 0, that is, no tick marks, or a value usually less than or equal to $\frac{\text{Xmax} - \text{Xmin}}{10}$. If your scl value is too small, the *x*-axis will appear too thick.)

Toggle the arrow key down to get to the *y*-values.

Ymin: −10 (This value is a number less than the minimum value of the *y*-coordinates. In this example, 0 would work, but a negative number allows you to see the *x*-axis.)

max: 50 (This value is a number greater than the maximum value of the *y*-coordinates.)

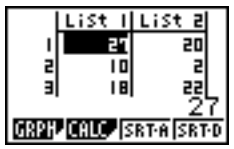
scl: 5 (This number is the distance between tick marks. You can use 0, that is, no tick marks, or a value usually less than or equal to $\frac{\text{Ymax} - \text{Ymin}}{10}$. If your scl value is too small, the *y*-axis will appear too thick.)

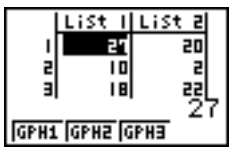
Press QUIT or EXE when you are done entering values. The view window shown is [0, 50, 5, −10, 50, 5].

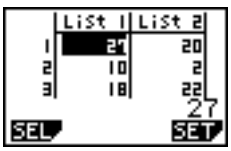
Displaying the Scatter Plot

a. Press F1 (**GRPH**) ▶ F4 (**SET**) to set up the graph.

b. Press F1 (**GPH1**).







c. Highlight **G-Type**. Press F1 (**Scat**). Choose **List 1** for **XList** and **List 2** for **YList** and 1 for **Freq**.

(continued)

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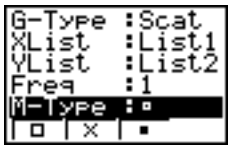
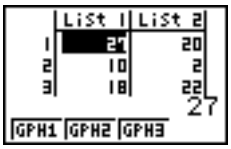
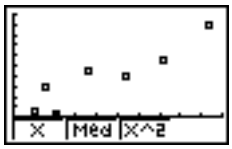
d. Arrow down to M-Type to choose the type of mark for the data points on the graph. Press QUIT.

e. Press F1 (GRPH) and choose F1 (GPH1).

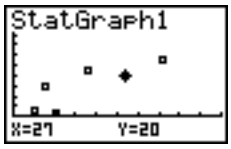






Tracing on a Scatter Plot

With the graph on the screen, press SHIFT [Trace]. Toggle the arrow key right and left to trace along the data points in the order in which they are entered in the data lists. Toggling the arrow key up and down will switch between different statistical graphs.



Graphing More Than One Scatter Plot at a Time

The calculator can graph up to three scatter plots at the same time. Follow the directions for making a scatter plot and set up GPH2, GPH3, or both. Be sure the list you select when setting up each scatter plot is the same list in which you've entered the data. Choose a different mark for each graph. Press QUIT F1 (GRPH) ▶ F1 (SEL). Turn on the graphs you want to view and press F4 (DRAW).

Errors

A Dim ERROR message means that the two lists do not have the same number of entries. The same error message could appear if you accidentally turned on a graph that you're not using or if you named the wrong list when you set up the scatter plot. To clear extra graphs from the screen, press SHIFT [Sketch] F1 (Cls).

Note 1G • POINTS Program

Link or manually enter the POINTS program into your calculator. (See **Note 0F** or **Note 0G.**) The POINTS program plots a single point in a graphing window that measures from −3.9 to 3.9 on the horizontal axis and from −2.3 to 2.3 on the vertical axis. You identify and enter the coordinates of the point rounded to the nearest 0.5 unit.

a. To execute the program, press MENU, select PRGM, arrow to POINTS, and press F1 (EXE). Remember to always press EXE to go to the next screen.

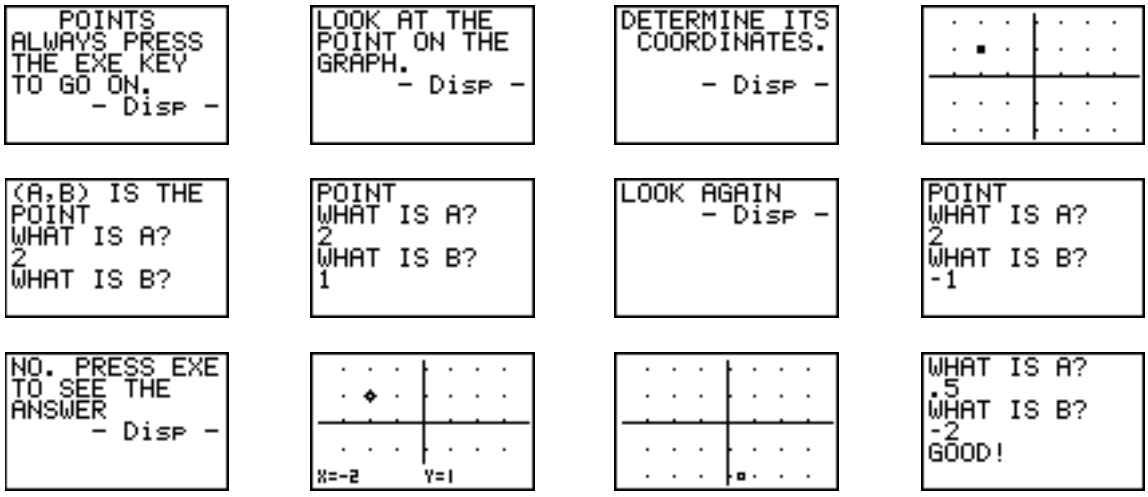
b. Study the screen and determine the coordinates of the marked point. Press EXE.

c. Enter the *x*-coordinate, press EXE, enter the *y*-coordinate, and press EXE again.

d. If you enter the wrong coordinates, the calculator will ask you to look again. By pressing EXE, you can look at the graph again and repeat **steps b** and **c.**

(continued)

e. If you enter the wrong coordinates a second time, the calculator will display the correct answer.



Errors

If you get an error, press [AC/ON] to interrupt the program's execution. Toggle the arrow key and press [EXE] to run the program again.

```
File Name:POINTS
0→N↵
"   POINTS"↵
"ALWAYS PRESS"↵
"THE EXE KEY"↵
"TO GO ON."◢
ClrText↵
"LOOK AT THE"↵
"POINT ON THE"↵
"GRAPH."◢
ClrText↵
"DETERMINE ITS COORDINATES."◢
{((Int (Ran#×10) Rmdr 12)÷2)−3}→List 1↵
{((Int (Ran#×10) Rmdr 8)÷2)−2}→List 2↵
Lbl 1↵
S-WindMan↵
ViewWindow −3.9,3.9,1,−2.3,2.3,1↵
S-Gph1 DrawOn,Scatter,List 1,
  List 2,1,Square↵
DrawStat↵
For −3→A To 3↵
For −2→B To 2↵
PlotOn A,B↵
Next↵
Next◢
ClrText↵
"(A,B) IS THE"↵
"POINT"↵
"WHAT IS A"?→C↵
"WHAT IS B"?→D↵
If C=List 1[1]↵
Then If D=List 2[1]↵
Then "GOOD!"↵
Goto 2↵
IfEnd↵
IfEnd↵
If N=0↵
Then N+1→N↵
ClrText↵
"LOOK AGAIN"◢
Goto 1↵
Else ClrText↵
"NO. PRESS EXE TO SEE THE"↵
"ANSWER"◢
Plot List 1[1],List 2[1]↵
Lbl 2
```

Note 1H • Connecting the Points

The **xyLine** connects a sequence of points with line segments. The order in which the points are connected is the order in which the coordinates appear in the lists.

Enter the data and set the window as described in **Note 1F.**

(continued)

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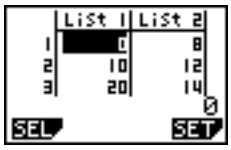
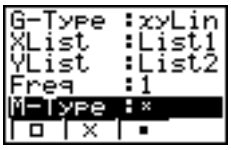
Displaying the Connected Points

a. Press F1 (GRPH) ▶ F4 (SET) to set up the graph.

b. Press F1 (GPH1).

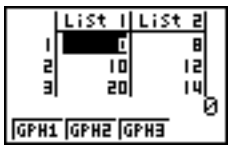


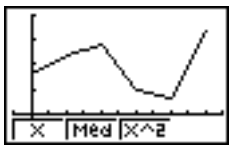


c. Highlight G-Type. Press F2 (xy). Choose List 1 for XList and List 2 for YList and 1 for Freq.

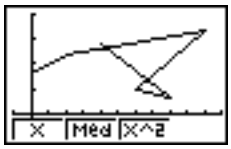
d. Arrow down to M-Type to choose the type of mark for the data points on the graph. Press QUIT.

e. Press F1 (GRPH) and choose F1 (GPH1).



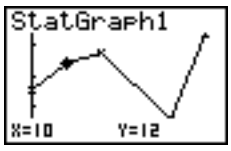


f. Press QUIT when you are ready to leave the graph screen.



If the points are not listed in ascending order by their *x*-coordinates, your xyLine will be scrambled, with segments crisscrossing each other. To reorder your points correctly, press QUIT F3 (SRT-A). To the question How Many Lists?, press 2. To the question Select Base List(B), press 1. To the question Select Second List(L), press 2. Press EXE after each answer. Notice that the sort command puts List 1 in ascending order but maintains the original pairings between List 1 and List 2.

Tracing Connected Points



With the graph on the screen, press SHIFT [Trace]. Toggle the arrow key right and left to trace along the data points in the order in which they are entered in the data lists. Toggling the arrow key up and down will switch between different statistical graphs.

Errors

A Dim ERROR message means that the two lists do not have the same number of entries. The same error message could appear if you accidentally turned on a plot that you're not using or if you named the wrong list when you set up the graph. To clear extra graphs from the screen, press SHIFT [Sketch] F1 (Cls).

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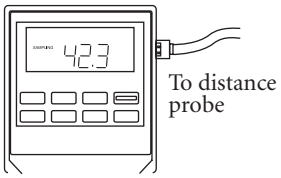
Note 1I • Reading a Distance Using the EA-100 or EA-200

To read a distance, you will need a Casio EA-100 or EA-200 Data Analyzer, an Ultrasonic Motion Sensor (distance probe), and a meterstick or meter tape. Your EA-100 or EA-200 does not need to be connected to a calculator to measure distance.



a. Connect your EA-100 or EA-200 to a distance probe from the sonic port on the right side of the EA-100 or EA-200.

b. Turn on the EA-100 or EA-200.

c. Press [MODE] until the EA-100 or EA-200 begins flashing SAMPLING and DONE alternately. Your EA-100 or EA-200 is now ready to measure in the multimeter mode.

d. Push the [CH-View] button several times until the EA-100 or EA-200 display indicates SONIC M.

You should see the distance probe's blinking red light and hear it clicking as it samples measurements (in meters) to the nearest object in front of it. As you point the distance probe at various objects, your EA-100 or EA-200 will display the distances to the nearest object in meters. Shown here is a reading of an object that is 3.14 meters from the probe.

e. Use your meterstick (tape) and hold the distance probe so the front of the probe is exactly 1 meter from the wall, then take a reading. Determine whether the distance is measured to the front, middle, or back of the probe. This knowledge is important for accurate length measurements. You will need to repeat this step if you change equipment, because not all devices work the same.

Errors

If you do not get a reading, check to make sure the distance probe is completely plugged into the port marked SONIC and that the link cable is securely connected.

Note 1J • Equations

To graph an equation on your calculator, the equation must be in the form $y =$ "some expression." If the equation contains variables other than x and y, you need to rewrite it using only x and y as variables.

a. Press [MENU] and select GRAPH.

b. Enter the equation using the variable x. Press [X,T] to enter the variable x. Press [EXE] to store the equation in Y1.

c. Setting a window for graphing equations is not as easy as setting a window for data. If it is an application problem, think about what values make sense for both x and y. You may need to try different windows to find one that is appropriate. To set the view window,

(continued)

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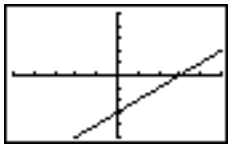
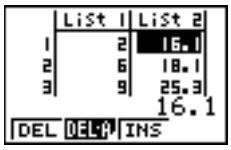
press [SHIFT] [V-Window]. Press [QUIT] when you're done setting the window. The graph below has view window [−5, 5, 1, −5, 5, 1].

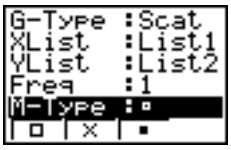
d. Press [F4] (DRAW).

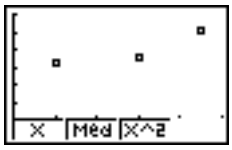


Tracing Equations and Plots on the Same Graph

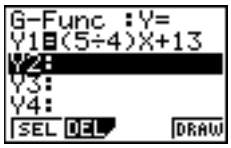
Press [MENU] and select STAT. Enter the data, set the view window, and set up and graph a scatter plot. The view window for the screens below is [0, 10, 2, −5, 30, 5]. List 1 contains {2, 6, 9}, and List 2 contains {16.1, 18.1, 25.3}.

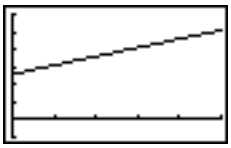


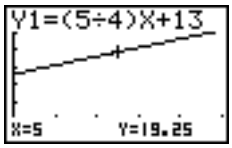




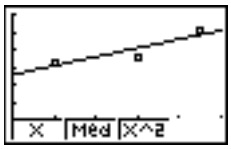
Press [MENU] and select GRAPH. Enter an equation and press [F4] (DRAW) to graph the equation and to see that it is what you want. Notice that the scatter plot does not appear on the graph. Press [SHIFT] [Trace] and use the arrow key to trace on the graph.

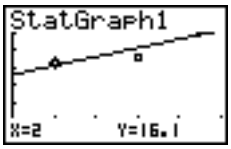






Press [MENU] and select STAT again. Press [F1] (GRPH) and then the function key for the scatter plot graph you just made. You'll see the scatter plot and the graph of the equation. Press [SHIFT] [Trace] and use the arrow key to trace on the scatter plot. The trace will not work on the graph of the equation while you are in STAT mode.

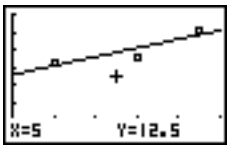


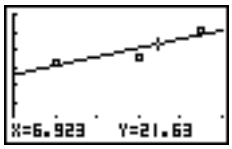


Press [SHIFT] [Sketch] [F3] (PLOT) [F1] (PLOT). You now have a "free" point on the screen with its coordinates shown at the bottom of the screen. Use the arrow key to move the point around your graph. You can see approximate coordinate values of your data points and the points of the graph of the equation. Pressing [SHIFT] [Trace] will allow you to trace the data in the scatter

(continued)

plot exactly. Pressing SHIFT [Trace] again brings back the "free" point with its coordinates.



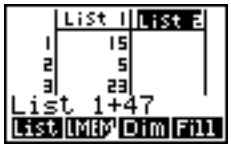


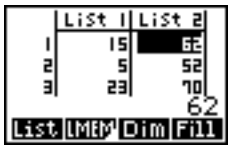
Errors

If you get a SYN ERROR message, check your equation and count the number of left and right parentheses, check for double decimal points, and check that you've used negative and subtraction signs correctly. If you see the Graph screen but nothing appears, you might have a problem with your equation or your view window. Check these settings. Remember that your view window must accommodate both the equation and the scatter plot.

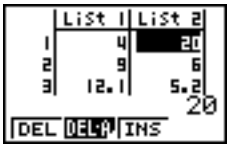
Note 1K • Formula-Generated Lists

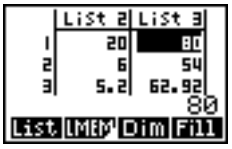
Enter the data into a list. (See **Note 1B.**) In this example, List 1 contains {15, 5, 23, 17, −12, 25}. Move the cursor to another list, arrow up to highlight the list name, and enter the formula for the operations you want to perform. For example, if List 2 is defined as List 1 plus 47, highlight List 2, press OPTN F1 (LIST) F1 (List) 1 + 4 7 EXE. If you get an error message, press AC/ON. Make sure you have highlighted the name of the list before you enter the list operation. You can perform operations with list variables the same way you do with numbers. You can add, subtract, multiply, divide, or do any other mathematical operation.





For another example, let List 1 be a list of rectangle lengths and let List 2 be a list of the corresponding widths. In this example, List 1 contains {4, 9, 12.1, 13, 18.5} and List 2 contains {20, 6, 5.2, 10.1, 15}. Move the cursor to the right to highlight List 3 and enter the formula for the area of a rectangle, List 1 × List 2. Press EXE.





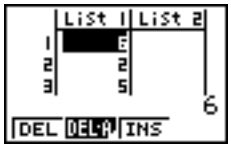
List Formulas

Notice that if you defined List 3 as the product of List 1 and List 2, then when you change one of the values in List 1 or List 2, List 3 does not automatically change. To update List 3, you need to reenter the formula.

Note 1R • Bar Graphs

Entering the Data

A bar graph requires a list containing no more than 14 items. In this example, List 1 contains the data {6, 2, 5, 1, 2, 4}. (See **Note 1B** if you need help making a list.)



(continued)

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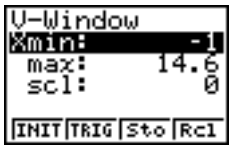
Setting the VIEW WINDOW Values

Press SHIFT [SET UP]. With S-Wind highlighted, press F2 (Man) QUIT. Press SHIFT [V-Window] and enter the following values into the View Window screen. Press EXE after each entry.

Xmin: −1 (This value is automatically set for all bar graphs.)

max: 14.6 (This value is automatically set for all bar graphs.)

scl: 0 (This value is automatically set for all bar graphs.)



Toggle the arrow key down to get the *y*-values.

Ymin: −1 (A negative value allows you to see the *x*-axis at the bottom of the screen.)

max: 7 (This value is a number slightly greater than the maximum data value in the list.)

scl: 1 (This number is the distance between tick marks on the *y*-axis. The number you choose will depend on the Ymax value. If your scl value is too small, the *y*-axis will appear too thick.)

Press QUIT when you are done entering values. The view window shown is [−1, 14, 6.0, −1, 7, 1].

Displaying the Bar Graph

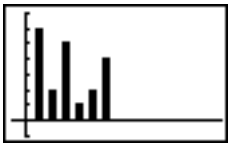
a. Press F1 (GRPH) ▶ F4 (SET) to set up the graph.

b. Press F1 (GPH1).

c. Highlight G-Type. Press ▶ four times. Press F1 (Bar). Choose List 1 for Data.

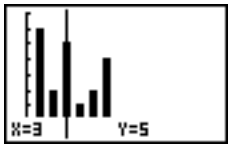
d. Press QUIT.

e. Press F1 (GRPH) and choose F1 (GPH1), or whichever graph you used.



Tracing on a Bar Graph

Press SHIFT [Trace] and use the arrow key to move from category to category. The *x*-value identifies the category number, that is, the position in your list. The *y*-value displays the value of the category.



Errors

A Dim ERROR message indicates that you have too many values in your list. A bar graph is limited to 14 list values.